

CS40/FX VAX INSTALLATION DIAGNOSTICS (IUC40F)

USER'S GUIDE



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1.1 INTRODUCTION

This manual is designed to serve as a guide for those using the Emulex CS40/FX Installation Diagnostic, IUC40F, on Digital Equipment Corporation (DEC) VAX-11 computers. IUC40F is designed to run under the Emulex VAX Monitor, EVM.

This program is designed for use by qualified installers of Emulex equipment, and thus it assumes that the user has some knowledge of hardware configurations, VAX architecture and terminology, and interpretation of error messages and device register contents.

This document contains two main sections, the contents of which are described briefly below.

- | | |
|-----------|---|
| Section 1 | General Description: This section contains an overview of IUC40F, including its functions, distribution media, hardware and software compatibility, and related documentation. |
| Section 2 | Operation: Describes operation of IUC40F, including load and start procedures, descriptions of diagnostic tests, operating instructions, CommXchange supervisor setup, and sample dialog. |

1.2 PRODUCT OVERVIEW

IUC40F is an installation and verification diagnostic that can be run with or without loopback connectors. With loopback connectors installed, the entire subsystem is tested, from the UNIBUS transceivers to the distribution panel input/output lines. If external loopback is not selected, then the data is looped back internally on the CC40 controller board.

The program performs 19 different tests. The HELP command, described in the EVM User's Guide, can be used to display a description of each of the 19 diagnostic tests run by IUC40F. For convenience, these test descriptions are also presented here.

Test 1 Master Reset and Register Addressability

This test verifies that the registers are addressable, and that they return to the proper status after Master Reset is issued.

Product Overview

Test 2 TX Ready, TX Enable, and TX Silo Test

This test verifies that the Transmit Silo Count register increments and decrements properly when data is written to and transferred from the transmit silo. The transmit silo count should return to 0 and set Transmit Ready after the data is transferred.

Test 3 RX Ready, RX Enable, and RX Data Test

This test verifies that the Receive Enable bit and Receiver Ready flag perform properly. Received data is also checked for validity.

Test 4 Character Length Test

This test verifies that all lines can transmit seven- and eight-bit characters.

Test 5 Stop Bit Test

This test checks to determine that all lines can be set for one and two stop bits.

Test 6 Parity Bit Test

This test verifies that the CS40 can be set for even or odd parity in seven-bit mode.

Test 7 Load Word Test

This test verifies that the transmitter silo can be loaded with two characters. The data is read back to check its validity.

Test 8 Flush Silo Test

This test verifies that setting the Flush Silo flag in Indirect Register 8 initializes the contents of the transmit silo for the line referenced.

Test 9 Preempt Test

This test verifies that, when the preempt bit is set, transmission halts and then resumes without loss of characters after another character is written to the same transmit silo.

Test 10 TX Interrupt Test

This test verifies that the device will interrupt when the transmit silo is empty. A transmit interrupt request occurs when the Transmit Ready bit becomes set and TX.IE is enabled.

Test 11 RX Interrupt Test

This test verifies that a receive interrupt is generated when data is in the receive silo and RX.IE is set.

1-2 General Description

Test 12 Multiple Interrupt

This test verifies that, when a transmit interrupt and a receive interrupt occur simultaneously, the receive interrupt takes precedence over the transmit interrupt.

Test 13 DMA Data Transfer, Part 1

This test verifies a DMA transfer to the asynchronous multiplexer. The character count and data are verified.

Test 14 DMA-Nonexistent Memory Error

This test verifies that a DMA NXM (non-existent memory) error occurs when a request is made to address non-existent memory space.

Test 15 DMA Odd and Even Address Boundary Test

This test verifies a DMA transfer to the asynchronous multiplexer using odd and even boundary addresses.

Test 16 DMA With Memory Extension Test

This test verifies a DMA transfer from the extended memory spaces.

Test 17 Split Baud Rate (External Loopback Mode Only)

This test verifies split baud rate operation by transmitting a null character at 4800 baud and receiving it at 9600 baud. The receiver silo should indicate that a framing error occurred. This test runs only in external loopback mode.

Test 18 DMA Data Transfer, Part 2

This test verifies that a block of 96 characters can be DMA transferred for each selected line.

Test 19 Data Reliability Test

This test runs all eight lines of each emulation (as determined by the selected line mask) concurrently to find interaction errors. An incrementing pattern of data is transmitted.

Compatibility

1.3 DISTRIBUTION MEDIA

Table 1-1 lists and describes distribution media for IUC40F.

Table 1-1. Distribution Media

Emulex Part Number	Type of Media	Partial Contents
VX9960402	TU58 for 11/730, 11/750	EVM.EXE IUC40F.EXE
VX9960502	Floppy for 11/780	EVM.EXE IUC40F.EXE
VX9960910	9-track mag tape for VAX-8600	

1.4 COMPATIBILITY

1.4.1 HARDWARE

IUC40F requires the following hardware:

- DEC VAX-11/730, 11/750, or 11/780
- Emulex CS40/FX communications controller
- Emulex DS01 CommXchange data switch
- Wrap-around test connectors for loopback tests

The CS40/FX normally is shipped with only one connector, but you may order more from the following address. Refer to Emulex part number CU3210201, DS01 Wrap-Around Connector.

Emulex Corporation
In-House Sales
3545 Harbor Blvd.
Costa Mesa, CA 92626

One DMF emulation (which is equivalent to eight lines) can be tested at a time with eight connectors. The operator selects these lines by entering a line mask at the appropriate IUC40F prompt, as explained in subsection 2.4.

1.4.2 SOFTWARE

IUC40F is designed to run with the Emulex VAX diagnostic monitor, EVM. For information on EVM, see the EVM User's Guide referenced in subsection 1.5.

1-4 General Description

1.5 RELATED DOCUMENTATION

Documents listed in this subsection can be ordered from the following address:

Emulex Corporation
3545 Harbor Blvd.
Costa Mesa, CA 92626
(714) 662-5600 TWX 910-595-2521

Title: Emulex VAX Monitor (EVM) User's Guide
Publication Number: VX9950901

Title: VAX Configuration Utility (IVV000) User's Guide
Publication Number: VX9950905

Title: CS40/FX Communications Subsystem Technical
Manual
Publication Number: CS4051001

Title: DS01 CommXchange Technical Manual
Publication Number: DS0151001

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2.1 OVERVIEW

This section includes IUC40F load and start procedures, diagnostic test definitions, operating instructions, sample CommXchange supervisor setup procedures, and sample user dialog.

User input appears in **bold type**, to distinguish it from diagnostic monitor prompts and program messages. In text, the symbol **<return>** indicates the carriage return key; **<CR>** in sample program output has the same meaning.

As used in prompts, the abbreviation DEC signifies decimal radix rather than Digital Equipment Corporation. Prompts for numeric parameters include the maximum and minimum acceptable values, followed by the default value in parentheses. The following example illustrates these conventions:

```
Enter emulation number [DEC - 0,5,(0)]>>>l<return>
```

For information regarding EVM command syntax, see the EVM User's Guide.

2.2 LOAD PROCEDURES

The procedure used to invoke EVM varies from one VAX system to another. For a description of EVM bootstrapping procedures, see the EVM User's Guide.

After the EVM> prompt has appeared on the screen, type the following:

```
EVM>LOAD IUC40F.EXE<return>
```

The LOAD statement may be followed by a SET CONFIGURATION statement, the content of which depends upon the VAX system being used. Sample configure statements for the VAX-11/730, 11-750, and 11-780 are presented in the following subsections.

2.2.1 SAMPLE CONFIGURE STATEMENT FOR VAX-11/730

The following example refers to a VAX-11/730 with one CS40/FX at CSR address 760340 and vector 300:

```
EVM>LOAD IUC40F.EXE<return>  
EVM>SET CONFIG/CSR:760340/VECTOR:300<return>
```

Load Procedures

2.2.2 SAMPLE CONFIGURE STATEMENT FOR VAX-11/750

The following example refers to a VAX/11-750 with one CS40/FX at CSR address 760340, vector 300, UNIBUS adapter UBA0 (base address FC0000), and device BR level 4:

```
EVM>LOAD IUC40F.EXE<return>
```

```
EVM>SET CONFIG/CSR:760340/VECTOR:300/ADAPTER:0/BR:4/UBR:5<return>
```

In the preceding statement, /ADAPTER needs to be specified only if it is other than UBA0: (the default). Acceptable values for ADAPTER are 0 or 1:

ADAPTER #0	UBA0, FC0000
ADAPTER #1	UBA1, F30000

BR needs to be specified only if the BR level of the UNIBUS adapter is other than 4. Acceptable values for BR are 4 through 7. Four is the default for UNIBUS adapters.

UBR needs to be specified only if the device BR level is other than 5. Acceptable values for UBR are 4 through 7. Five is the default for all Unibus devices.

2.2.3 SAMPLE CONFIGURE STATEMENT FOR VAX-11/780

The following example refers to a VAX-11/780 with the same configuration as the 11/750 in the previous example. UBA0 corresponds to TR 3:

```
EVM>LOAD IUC40F.EXE<return>
```

```
EVM>SET CONFIG/CSR:760340/VECTOR:300/TR:3/BR:4/UBR:5<return>
```

In the preceding statement, /TR is optional and needs to be specified only if it is other than TR 3 (UBA0). Valid values for this parameter are 3 through 6, with 3 the default:

TR 3	UBA0, 20100000
TR 4	UBA1, 20140000
TR 5	UBA2, 20180000
TR 6	UBA3, 201C0000

BR needs to be specified only if the BR level of the UNIBUS adapter is other than 4. Acceptable values for BR are 4 through 7. Four is the default for UNIBUS adapters.

UBR needs to be specified only if the device BR level is other than 5. Acceptable values for UBR are 4 through 7. Five is the default for all Unibus devices.

2.3 OPERATING INSTRUCTIONS

There are several strategies for using IUC40F to test the CS40 Communications Subsystem. IUC40F can be used to test just the CC40 communications controller to ensure that:

- o It is installed at the bus address that you think it is
- o It responds appropriately to commands
- o Its internal data paths are sound
- o It interrupts the CPU using the proper vector
- o It can perform DMA.

All of the above can be accomplished by using IUC40F in the internal loopback mode (i.e., test data transmissions are looped back within the CC40). In the internal mode, however, the DS01 Data Switch and the composite link that connects the CC40 to the DS01 are not tested. To test the DS01 and the link, you must use IUC40F's external loopback mode.

When testing the subsystem in external loopback mode, individual caller and destination lines on the DS01 must be connected. This can be done in two ways. The DS01 can be configured to connect the lines automatically (autoconnect), or the lines can be connected manually by using the DS01's supervisor port.

The procedures for running IUC40F in the three modes are quite different, and are described separately. See subsection 2.3.1 for internal loopback instructions, 2.3.2 for external loopback with autoconnect instructions, and 2.3.3 for external loopback with manual connect instructions.

2.3.1 INTERNAL LOOPBACK MODE

When the internal loopback mode is selected, nothing needs to be done with the DS01. Simply follow the instructions in this subsection.

1. After entering the LOAD and SET CONFIGURATION statements, start IUC40F as shown:

```
EVM>START/PASSES:3<return>
```

The qualifier /PASSES is optional and needs to be specified only if multiple passes are desired; in this example, the operator has specified that three passes are to be run. The default value for this parameter is 1. Acceptable values are 0 through 100, where 0 signifies an infinite number of passes.

After the program identifies itself, it displays the following message:

```
Searching for NXM, please wait...
```

This message indicates that the program is searching for a Non-Existent Memory location for use in Test 14.

Operating Instructions

2. After completing this function, the program displays the following message and prompt:

All tests can run in internal or external loopback mode with the exception of test 17 which only runs in external loopback mode. If running in external loopback mode, loopback (wrap) connectors are required for all selected lines. Use the emulation count and line masks to select specific lines.

Do you wish to run test(s) with loopback connectors ?
[(N)]>>>

Select the default response, N (no), by entering <return>. Test 17 will not be run.

3. The program then prompts for the number of emulations, as follows:

Number of emulations: [DEC - 1,12,(1)]>>>

Enter the number of emulations (groups of eight lines each) for which your CS40 Communications Subsystem is configured. The default response is 1.

4. Next, the program asks:

Do you wish to alter the line masks ? [(N)]>>>

If you enter N (no) or simply <return>, the program will use the current default line mask for each emulation. The initial default value is FF hex, which tests all eight lines of the emulation. If you enter Y (yes) at this prompt, the program requests a line mask for each emulation that you have specified:

Enter line mask for emulation 0
[HEX - 0,FF,(FF)]>>>
.
.
.
Enter line mask for emulation n
[HEX - 0,FF,(FF)]>>>

The lines of an emulation are enabled or disabled by setting the appropriate bit in the line mask to one or zero (respectively). The bits are represented to the program by using hexadecimal notation. For example, to enable line three of an emulation, set bit three of the line mask to one. This is represented as 08 in hex.

After you have entered the line masks (if required), IUC40F will begin executing its tests in numerical order. See 2.4, Sample Dialog.

2.3.2 EXTERNAL LOOPBACK MODE WITH AUTOCONNECT

In external loopback mode, test data is transmitted by the program through the CC40, composite link, CI40, and DS01 line boards to an RS232 connector (one to which you would connect a user terminal) where the data is looped back to the subsystem through a loopback connector. This mode allows all subsystem data paths to be verified.

When using the autoconnect feature of the DS01, you will need to reconfigure the DS01 so that the lines represented by the CI40 are the callers and the RS232 connectors represented by the line boards are the destinations. If you have already configured your DS01 for normal operation, you will have to change that configuration to allow automatic connection. Autoconnect allows many lines to be checked easily; if you only wish to check a few lines, use the manual connect procedure outlined in 2.3.3.

To perform the external loopback tests, you must have as many loopback connectors as you have lines to test. If you do not have enough loopback connectors to test all of the lines simultaneously, use the line mask to limit the number of lines tested to the number of loopback connectors which you have. You can order additional loopback connectors from Emulex. See subsection 1.4.1.

To run IUC40F in the external loopback mode with autoconnect, follow the procedure given below.

1. Set the halt-on-error flag:

EVM>SET FLAG HALT

2. The external loopback mode requires that you configure the DS01 so that the CC40 is the caller and the RS232 connectors are the destinations (this is backwards, the terminals at the RS232 connectors are usually the callers and the CC40 is the destination). Reconfiguring the DS01 erases the existing configuration (if you have made one). If your DS01 has dual processors, copy your configuration to the offline processor for recall at the end of the diagnostic run.

This subprocedure explains how to configure three DMF emulations of eight lines each, for a total of 24 lines. The sample procedure presented here assumes the following conditions:

- o The CI40 board is inserted in slot 4 of the DS01.
- o There are two 12-line boards inserted in slots 15 and 16.
- o A VT100-compatible terminal is connected to the supervisor port.

Operating Instructions

Steps a through ag must be performed before you start IUC40F.

Enter the following commands on the supervisor terminal:

a.	M<return>	Return to main menu.
b.	1<return>	Select system command menu.
c.	2<return>	Select system initialization.
d.	SYSINIT<return>	Initialize former configuration.
e.	Y<return>	Respond to "ARE YOU SURE?" (SYSINIT takes 2 minutes to complete.)
f.	2<return>	Select port terminal type. This input selects VT100.
g.	4<return>	Select destination parameters menu.
h.	1<return>	Define destination parameters.
i.	D1<return>	Enter name of destination group.
j.	5<return>	Select Echo parameter.
k.	N<return>	Disable Echo.
l.	M<return>	Return to main menu.
m.	5<return>	Select caller parameters menu.
n.	1<return>	Define caller parameters.
o.	C1<return>	Enter name of caller group.
p.	5<return>	Select Echo parameter.
q.	N<return>	Disable Echo.
r.	10<return>	Select destination access list.
s.	1<return>	Select list addition.
t.	A<return>	Add ALL destinations to the list.
u.	M<return>	Return to main menu.
v.	7<return>	Select line assignment menu.
w.	1<return>	Define line assignments.
x.	2<return>	Assign caller parameters.
y.	1<return>	Select C1 set.
z.	4T-ALL<return>	Select all caller lines.
aa.	M<return>	Return to main menu.
ab.	7<return>	Select line assignment menu.
ac.	1<return>	Define line assignments.
ad.	1<return>	Assign destination parameters.
ae.	1<return>	Select D1 set.
af.	15TALL<return>	Select a group of six lines.
	15BALL<return>	Select a group of six lines.
	16TALL<return>	Select a group of six lines.
	16BALL<return>	Select a group of six lines.
ag.	M<return>	Return to main menu.

3. Start IUC40F as shown in the following example. The qualifier /PASSES is optional and needs to be specified only if multiple passes are desired; in this example, the operator has specified that three passes are to be run. The default value for this parameter is 1. Acceptable values are 0 through 100, where 0 signifies an infinite number of passes.

EVM>START/PASSES:3<return>

After the program identifies itself, it displays the following message:

Searching for NXM, please wait...

This message indicates that the program is searching for a Non-Existent Memory location for use in Test 14.

4. After completing this function, the program displays the following message and prompt:

All tests can run in internal or external loopback mode with the exception of test 17 which only runs in external loopback mode. If running in external loopback mode, loopback (wrap) connectors are required for all selected lines. Use the emulation count and line masks to select specific lines.

Do you wish to run test(s) with loopback connectors ?
[(N)]>>>

State that you want to use loopback connectors by entering Y<return>.

5. The program then prompts for the number of emulations, as follows:

Number of emulations: [DEC - 1,12,(1)]>>>

Enter the number of emulations (groups of eight lines each) for which your CS40 Communications Subsystem is configured. The default response is 1.

6. Next, the program asks:

Do you wish to alter the line masks ? [(N)]>>>

If you enter N (no) or simply <return>, the program will use the current default line mask for each emulation. The initial default value is FF hex, which tests all eight lines of the emulation. If you enter Y (yes) at this prompt, the program will then request a line mask for each emulation that you have specified:

Enter line mask for emulation 0
[HEX - 0,FF,(FF)]>>>
.
.
.
Enter line mask for emulation n
[HEX - 0.FF,(FF)]>>>

Operating Instructions

The lines of an emulation are enabled or disabled by setting the appropriate bit in the line mask to one or zero (respectively). The bits are represented to the program by using hexadecimal notation. For example, to enable line three of an emulation, set bit three of the line mask to one. This is represented as 08 in hex.

7. The following message is then displayed:

Please wait 15 seconds for link establishment...

The program delays as indicated, in order to allow the CC40 and CI40 boards to establish the high-speed composite link.

8. The program then asks:

Do you wish to AUTO-CONNECT? [(N)]>>>Y<return>

Respond Y to indicate that you do.

The program displays the auto-connect chart as it is created, in order to verify that the auto-connect sequence is proceeding smoothly and without error:

Beginning Auto-connect sequence, please wait...

Emulation # 0 Line #0 1 2 3 4 5 6 7

.
.
.

Emulation # n Line #0 1 2 3 4 5 6 7

The program will begin executing as soon as it has finished auto-connecting the lines. The program will fail Test 3 and halt.

9. Determine which CI40 lines are connected to which destination lines by using the DS01 monitor. To do this, issue the following commands

- | | |
|-----------------|--|
| a. M<return> | Return to main menu |
| b. 2<return> | Select the Monitor Menu |
| c. 5<return> | Select the Central Unit |
| d. 4<return> | 4 is the CI40's slot in the DS01
for this example |

10. Note which CI40 lines are connected to which output lines, and install your loopback connectors appropriately.

11. Abort IUC40F as follows:

EVM>ABORT<return>

12. Clear the Halt-On-Error flag as follows:

EVM>CLEAR FLAGS HALT

13. Restart IUC40F as described in step 3. You will have to answer the questions in steps 4, 5, and 6 again. When the program has completed, reconfigure the DS01. See the DS01 Technical Manual for instructions.

2.3.3 EXTERNAL LOOPBACK MODE WITH MANUAL CONNECT

In external loopback mode, test data is transmitted by the program through the CC40, composite link, CI40, and DS01 line boards to an RS232 connector (one to which you would connect a user terminal) where the data is looped back to the subsystem through a loopback connector. This mode allows all subsystem data paths to be verified.

If you wish only to test a few lines, using manual connect instead of autoconnect should be a good solution. The manual method does not require you to reconfigure the DS01 and could require fewer loopback connectors. However, the manual connection procedure that uses the supervisor port is cumbersome, so if you wish to test many lines, use the autoconnect version.

To perform the external loopback tests, you need as many loop-back connectors as there are lines enabled by the line mask. You can order additional loopback connectors from Emulex. See subsection 1.4.1.

To run IUC40F in the external loopback mode with manual connect, follow the procedure given below.

1. Start IUC40F as shown in the following example. The qualifier /PASSES is optional and needs to be specified only if multiple passes are desired; in this example, the operator has specified that three passes are to be run. The default value for this parameter is 1. Acceptable values are 0 through 100, where 0 signifies an infinite number of passes.

```
EVM>START/PASSES:3<return>
```

After the program identifies itself, it displays the following message:

```
Searching for NXM, please wait...
```

This message indicates that the program is searching for a Non-Existent Memory location for use in Test 14.

Operating Instructions

2. After completing this function, the program displays the following message and prompt:

All tests can run in internal or external loopback mode with the exception of test 17 which only runs in external loopback mode. If running in external loopback mode, loopback (wrap) connectors are required for all selected lines. Use the emulation count and line masks to select specific lines.

Do you wish to run test(s) with loopback connectors ?
[(N)]>>>

State that you want to use loopback connectors by entering Y<return>.

3. The program then prompts for the number of emulations, as follows:

Number of emulations: [DEC - 1,12,(1)]>>>

Enter the number of emulations (groups of eight lines each) for which your CS40 Communications Subsystem is configured. The default response is 1.

4. Next, the program asks:

Do you wish to alter the line masks ? [(N)]>>>

Enter Y (yes) at this prompt; you must limit the lines tested to the line which you have connected in Step 2. The DMF32 emulation lines and the CI40 line numbers correspond as follows:

Emulation 0, line 0	4T-1
Emulation 0, line 1	4T-2
Emulation 0, line 2	4T-3
Emulation 0, line 3	4T-4
Emulation 0, line 4	4T-5
.	
.	
.	
Emulation n, line m	4T-(n*m)

The program requests a line mask for each emulation that you have specified:

Enter line mask for emulation 0
[HEX - 0,FF,(FF)]>>>
.
.
.
Enter line mask for emulation n
[HEX - 0.FF,(FF)]>>>

The lines of an emulation are enabled or disabled by setting the appropriate bit in the line mask to one or zero (respectively). The bits are represented to the program by using hexadecimal notation. For example, to enable line three of an emulation, set bit three of the line mask to one. This is represented as 08 in hex.

5. The following message is then displayed:

Please wait 15 seconds for link establishment...

The program delays as indicated, in order to allow the CC40 and CI40 boards to establish the high-speed composite link.

6. The program then asks:

Do you wish to autoconnect? [(N)]>>>N<return>

Respond N to indicate that you do not.

7. The program will prompt you to connect the CI40 (caller) lines to destination lines:

Manually connect the selected lines, are you ready? [(Y)]

Use the supervisor port to connect the lines that you wish to test. The following procedure tells how to connect two lines in the DS01 so that they can be tested. The sample procedure presented here assumes the following conditions:

- o The CI40 board is inserted in slot 4 of the DS01.
- o There is a 12-line board inserted in slot 15.
- o A VT100-compatible terminal is connected to the supervisor port.

Enter the following commands on the supervisor terminal:

- | | |
|-----------------|------------------------------------|
| a. M<return> | Return to main menu. |
| b. 2<return> | Select call/line control menu. |
| c. 1<return> | Force a call. |
| d. 4T-1<return> | Enter the caller line number. |
| e. 15T2<return> | Enter the destination line number. |
| f. 4T-2<return> | Enter the caller line number. |
| g. 15T3<return> | Enter the destination line number. |

Install loopback connectors on the RS232 connectors of the selected lines.

Sample Dialog

Now type <return> at the prompt to indicate that you are ready.

Manually connect the selected lines, are you ready? [(Y)]
<return>

The program will begin executing.

2.4 SAMPLE DIALOG

The following sample dialog assumes the following conditions:

- o The operator wishes to run all tests without loopback connectors; therefore, test 17 is skipped. /PASSES is not specified, so the program runs one pass.
- o Six emulations are to be tested.
- o Lines 0 through 7 of each emulation are to be tested (line mask FF).

Note that, in some cases, dialog has been continued to a second line of text in this document because of space limitations.

```
EMULEX VAX MONITOR REV 1.0 VAX-11/7xx DD-MMM-YYYY TIME
```

```
EVM>ST<return>
```

```
IUC40F Emulex VAX-Unibus CS40 Diagnostic REV Vn.m DD-MMM-YYYY TIME
```

```
Searching for NXM, please wait...
```

All tests can run in internal or external loopback mode with the exception of test 17 which only runs in external loopback mode. If running in external loopback mode, loopback (wrap) connectors are required for all selected lines. Use the emulation count and line masks to select specific lines.

```
Do you wish to run test(s) with loopback connectors ? [(N)]>>>  
<return>
```

```
Number of emulations: [DEC - 1,12,(1)]>>> 6<return>
```

```
Do you wish to alter the line masks ? [(N)]>>> <return>
```

```
Please wait 15 seconds for link establishment...
```

```
TEST # 1 MASTER RESET & REGISTER ADDRESSABILITY DD-MMM-YYYY TIME  
TEST # 2 TX READY, TX ENABLE AND TX SILO TEST DD-MMM-YYYY TIME  
TEST # 3 RX ENABLE, RX READY, RX DATA TEST DD-MMM-YYYY TIME  
TEST # 4 CHARACTER LENGTH TEST DD-MMM-YYYY TIME  
TEST # 5 STOP BIT TEST DD-MMM-YYYY TIME  
TEST # 6 PARITY BIT TEST DD-MMM-YYYY TIME
```

TEST # 7 LOAD WORD TEST DD-MMM-YYYY TIME
TEST # 8 FLUSH SILO TEST DD-MMM-YYYY TIME
TEST # 9 PREEMPT TEST DD-MMM-YYYY TIME
TEST # 10 TX INTERRUPT TEST DD-MMM-YYYY TIME
TEST # 11 RX INTERRUPT TEST DD-MMM-YYYY TIME
TEST # 12 MULTIPLE INTERRUPT DD-MMM-YYYY TIME
TEST # 13 DMA DATA TRANSFER, PART 1 DD-MMM-YYYY TIME
TEST # 14 DMA NON-EXISTENT MEMORY ERROR DETECTION TEST DD-MMM-YYYY
TEST # 15 DMA ODD AND EVEN ADDRESS BOUNDARY TEST DD-MMM-YYYY TIME
TEST # 16 DMA MEMORY EXTENSION TEST DD-MMM-YYYY TIME
TEST # 17 SPLIT BAUD RATE (EXTERNAL LOOPBACK MODE ONLY) DD-MMM-YYYY
Test skipped, does not run in internal loopback mode
TEST # 18 DMA DATA TRANSFER, PART 2 DD-MMM-YYYY TIME
TEST # 19 DATA RELIABILITY TEST DD-MMM-YYYY TIME

SUMMARY REPORT:

TOTAL # ERRORS = 0 (0 SYSTEM, 0 DEVICE, 0 HARD, 0 SOFT)
DD-MMM-YYYY TIME

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